Serial No.	H-V028 E-8-CE

Diaphragm Valves Type 14

True Union Diaphragm Valves Type14

User's Manual

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ASAHI AVVALVES

(1) General operating instructions

- Operate the valve within the pressure Vs temperature range.
  （The valve can be damaged by operating beyond the allowable range.）

- Select a valve material that is compatible with the media, refer to “CHEMICAL RESISTANCE ON ASAHI AV VALVE”.
  （Some chemicals may damage incompatible valve materials.）

- Bonnet bolt torque should be checked before installation, as they may become loose after long-term storage. A periodic check of the valve condition as well as bonnet & flange bolt torque should be made part of preventative maintenance program properly re-tightening the bolts as necessary. It is especially important to re-tighten all bolts during the first shutdown.
  (Refer to page 5.)

- The travel stop may have to be adjusted if media leakage is detected between the upstream & downstream sides of the valve.

- Do not step on the valve or apply excessive weight on valve. (It can be damaged.)

- Do not exert excessive force in closing or opening the valve.

- Make sure to consult a waste treatment dealer to dispose of the valves.
  (Poisonous gas is generated when the valve is burned improperly.)

- Allow sufficient space for maintenance and inspection.

- Keep the valve away from excessive heat or fire. (It can be deformed, or destroyed.)

- The valve should be operated by hand.

(2) General instructions for transportation, unpacking and strange

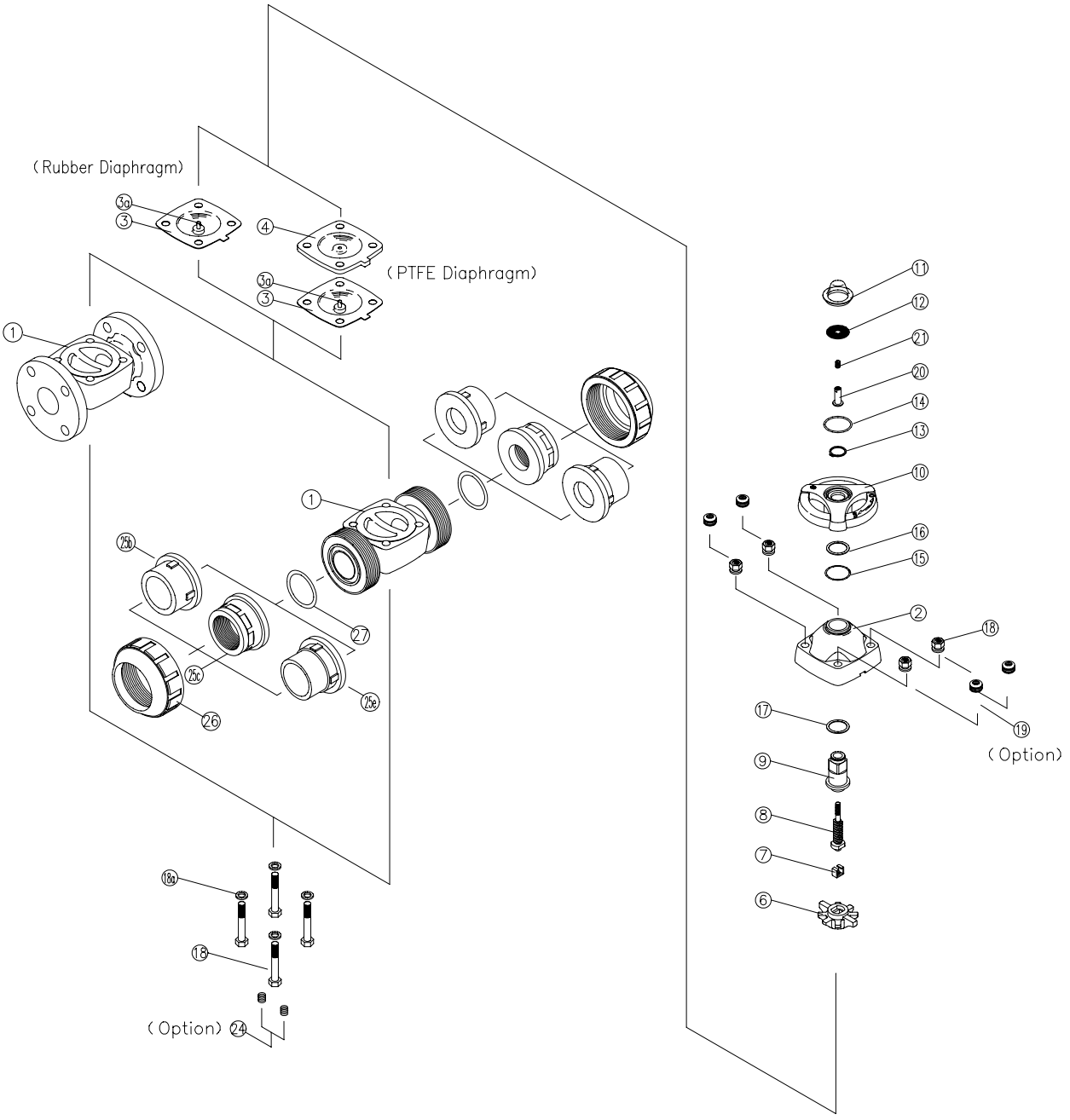
- Keep the valve packed in the carton or box as delivered until installation.

- Keep the valve away from coal tar, creosote (antiseptic for wood), termite insecticide, vermicides, and paint.
  （The could cause swelling and damage the valve.）

- Do not impact or drop the valve. (It can be damaged.)

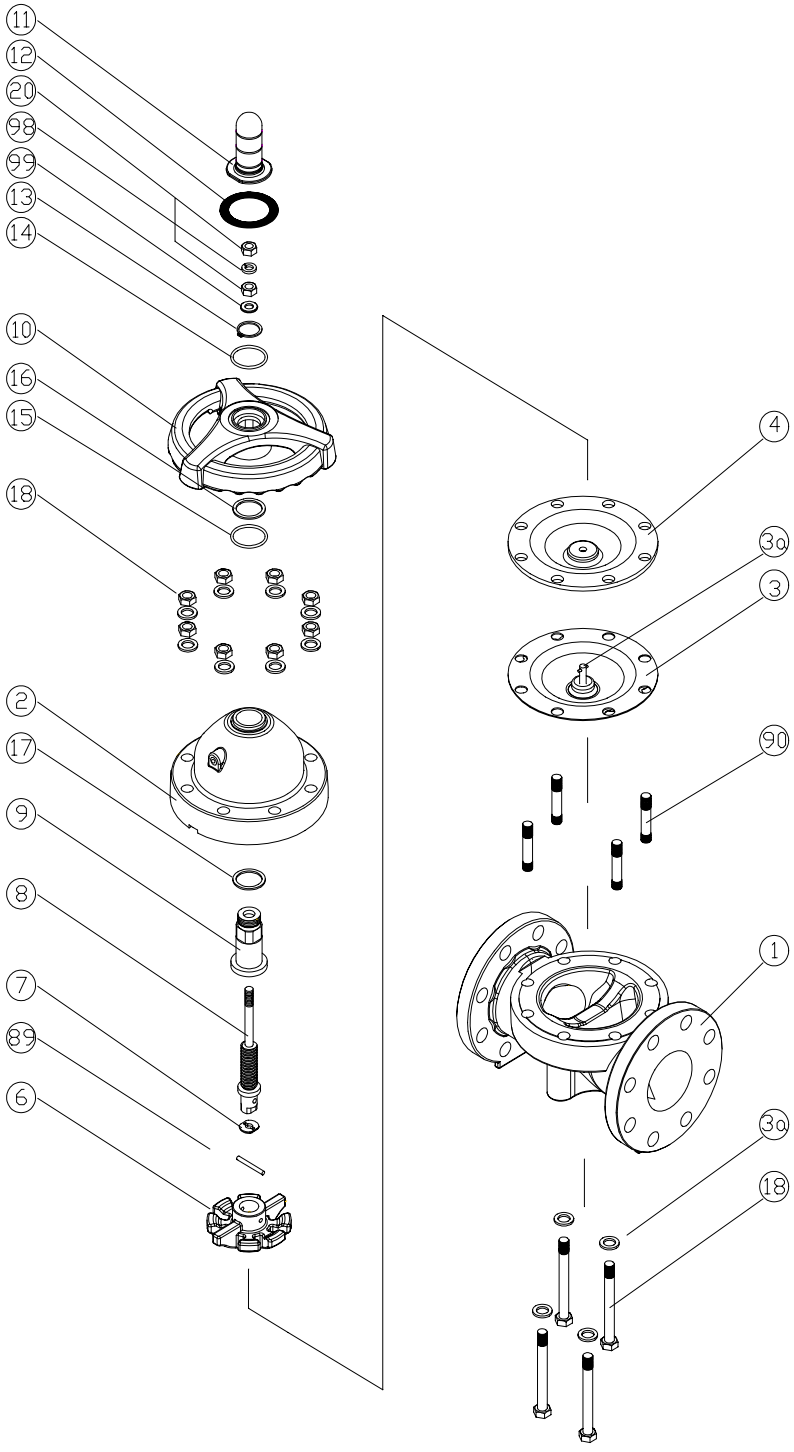
- Avoid scratching the valve with any sharp object.

(3) Name of parts



Diaphragm ④ is available only when diaphragm ③a is PTFE .

No.	DESCRIPTION	No.	DESCRIPTION	No.	DESCRIPTION
①	Body	⑪	Gauge cover	⑳	Stopper
②	Bonnet	⑫	Name Plate	㉑	Screw
③b	Diaphragm	⑬	Retaining ring c-type	㉔	Metal insert (Ensat)
③a	Inserted metal of DIA	⑭	O-ring (A)	㉕b	End connector (Socket end)
④	Cushion	⑮	O-ring (B)	㉕c	End connector (Threaded end)
⑥	Compressor	⑯	Thrust ring (A)	㉕e	End connector(Spigot end)
⑦	Joint	⑰	Thrust ring (B)	㉖	Union nut
⑧	Stem	⑱	Bolt, Nut (A)	㉗	O-ring (C)
⑨	Sleeve	⑱a	Washer		
⑩	Handle wheel	⑲	Conical spring washer		

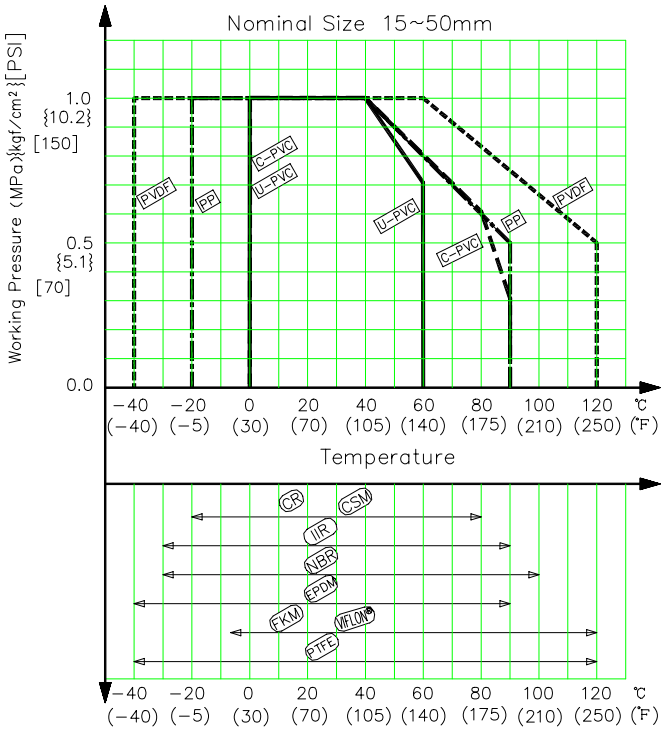


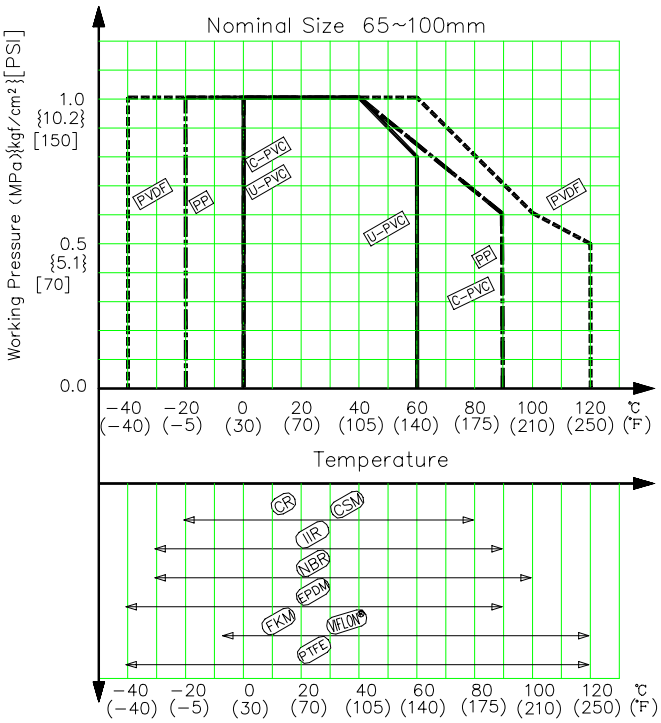
Diaphragm ④ is available only when diaphragm ③a is PTFE .

No.	DESCRIPTION	No.	DESCRIPTION	No.	DESCRIPTION
①	Body	⑨	Sleeve	⑰	Thrust ring(B)
②	Bonnet	⑩	Handwheel	⑱	Bolt, Nut (A)
③	Diaphragm	⑪	Gauge cover	⑱a	Washer (A)
③a	Inserted metal of DIA	⑫	Name plate	⑳	Stopper
④	Cushion	⑬	Retaining ring-c type	⑧⑨	Compressor pin
⑥	Compressor	⑭	O-ring(A)	⑨⓪	Inserted nut
⑦	Joint	⑮	O-ring(B)	⑨⑧	Spring washer
⑧	Stem	⑯	Thrust ring(A)	⑨⑨	Valve sheet

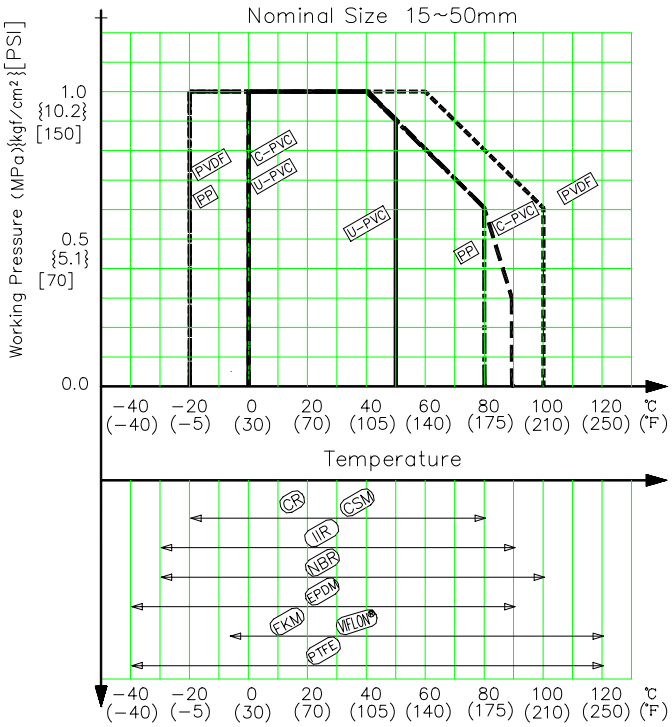
(4) Comparison between operating temperature and pressure

Flange





True Union (Socket, Threaded, Spigot)



Caution

Do not operate valve beyond the range of working temperature and pressure.
(The valve can be damaged.)

(5) Installation procedure

Flanged type (Material : PVC, C-PVC, PP, PVDF)

Necessary items

- Torque wrench
- Spanner wrench
- AV gasket（When a non-AV gasket is used ,a different tightening torque specification should be followed.)
- Bolt, Nut, Washer (For many flanges specification)

Procedure

1) Set the AV gasket between the flanges.

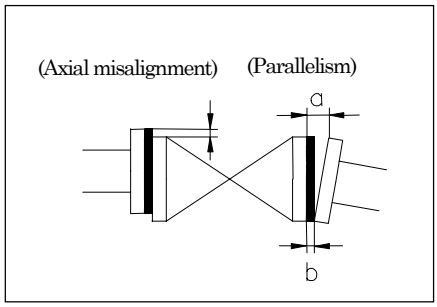
2) Insert washers and bolts from the pipe side, insert washers and nuts from the valve side, then temporarily tighten them by hand.

⚠ Caution

The parallelism and axial misalignment of the flange surface should be under the values shown in the following table to prevent damage the valve.
（A failure to observe them can cause destruction due to stress application to the pipe.）

Unit : mm (inch)

Nom. Size	Axial misalignment	Parallelism (a-b)
15-32mm (1/2"-1 1/4")	1.0 (0.04)	0.5 (0.02)
40, 50mm (1 1/2"-2")	1.0 (0.04)	0.8 (0.03)
65-100mm (2 1/2"-4")	1.0 (0.04)	(0.04)

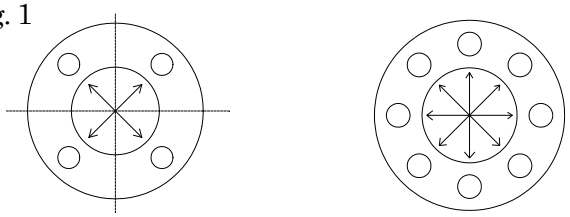


3) Tighten the bolts and nuts gradually with a torque wrench to the specified torque level in a diagonal manner. (Refer to Fig.1.)

Recommended torque value Unit: N-m {kgf-cm} [lb-inch]

Nom. Size	15-20mm (1/2"-3/4")	25-40mm (1"-1 1/2")	50, 65mm (2"-2 1/2")	80, 100mm (3", 4")
Torque value	17.5 {179} [155]	20.0 {204} [177]	22.5 {230} [200]	30.0 {306} [266]

Fig. 1



⚠ Caution

Avoid excessive tightening. (The valve can be damaged.)

Threaded type (Material : PVC, C-PVC, PP, PVDF)

Necessary items

- Sealing tape（A non-sealing tape can cause leakage.）
- Strap wrench（Do not use Pipe wrench.）
- Spanner wrench

⚠ Caution

Make sure that the threaded connections are plastic x plastic.
（Metallic thread can destroy the body cap）

Procedure

1) Wind a sealing tape around the external thread of joint, leaving the end (about 3mm) free.
2) Loosen the union nut ㉖ with a strap wrench..
3) Remove the union nut ㉖ and the end connector㉕b .
4) Lead the union nut ㉖ through the pipe.
5) Tighten the external thread of the joint and the end connector㉕b hardly with hand.
6) Using a spanner wrench, screw in the end connector㉕b by turning 180° - 360° carefully without damaging it.

⚠ Caution

Avoid excessive tightening. (The valve can be damaged.)

7) Make sure that the O-ring (C) ㉗ is mounted.
8) Set the end connector㉕b and union nut ㉖ directly on the body without allowing the O-ring (C) ㉗ to come off.
9) Tighten union nut ㉖ on each valve until hand tight.
10) Using a strap wrench tighten union nuts uniformly on each side approx 90° - 180° turns, 1/4 to 1/2 turns.

⚠ Caution

Avoid excessive tightening.（The valve can be damaged.）

Socket type (Material : PVC,C-PVC)

Necessary items

- Adhesive for hard vinyl chloride pipes
- Strap wrench

⚠ Caution

Do not install a socket type valve where the atmospheric temperature is 5℃or lower.
(The valve can be damaged.)

Procedure

1) Loosen the union nut ㉖ with a strap wrench.

2) Remove the union nut ㉖ and end connector㉕b .

3) Lead the union nut through the pipe.

4) Clean the hub part of the end connector㉕b by wiping with a waste cloth.

5) Apply adhesive evenly to the hub part of the end connector㉕b and the pipe spigot.

⚠ Caution

Do not apply more adhesives than necessary.
(The valve can be damaged due to solvent cracking.)

Adhesive quantity (guideline)

Nom. Size	15mm (1/2")	20mm (3/4")	25mm (1")	32mm (1 1/4")	40mm (1 1/2")	50mm (2")	65mm (2 1/2")	80mm (3")	100mm (4")
Quantity(g)	1.0	1.3	2.0	2.4	3.5	4.8	6.9	9.0	13.0

6) After applying adhesive, insert the pipe quickly to the end connector㉕b and leave it alone for at least 60 seconds.

7) Wipe away overflowing adhesive.

8) Make sure that O-ring(C) ㉗ is mounted

9) Tighten union nut ㉖ on each valve until hand tight.

10) Using a strap wrench tighten union nuts uniformly on each side approx. 90° - 180° turns, 1/4 to 1/2 turns.

11) Using a strap wrench, screw it in by turning 90° - 180° carefully without damaging it.

⚠ Caution

Avoid excessive tightening. (The valve can be damaged.)

Socket type (Material : PP,PVDF)
Spigot type (Material : PP,PVDF)

Necessary items

- Strap wrench（Do not use the pipe wrench.）
- Sleeve welder or automatic welding machine
- User's manual for sleeve welder or automatic welding machine

Procedure

1) Loosen the union nut with a strap wrench.
2) Remove the union nut ㉖ and the end connector㉕b.
3) Lead the union nut ㉖ through the pipe.
4) For the next step, refer to the user's manual for the sleeve welder or the automatic welding machine.
5) After welding, make sure that the O-ring (C) ㉗ is mounted.
6) Set the end connector㉕b and the union nut ㉖ directly without allowing the O-ring (C) ㉗ to come off.
7) Tighten union nut ㉖ on each valve until hand tight.
8) Using a strap wrench tighten union nuts uniformly on each side approx. 90° - 180° turns, 1/4 to 1/2 turns.

⚠ Caution

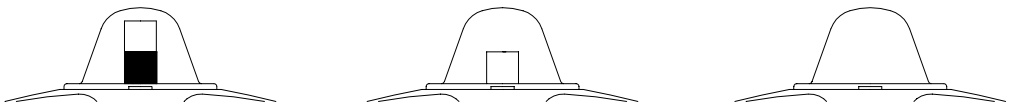
Avoid excessive tightening. (The valve can be damaged.)

(6) Operating Procedure

○ Open and shut the valve by rotating handle wheel.

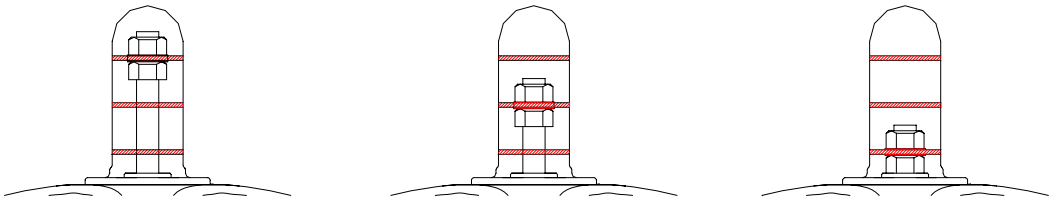
○ The top of the travel stop will be flush with the top of the handle wheel when the valve is fully closed.

< Nominal size : 15-50mm (1/2”-2”)>



Full open Half open Full shut

< Nominal size : 65-100mm (2 1/2”-4”)>



Full open Half open Full shut

⚠ Caution

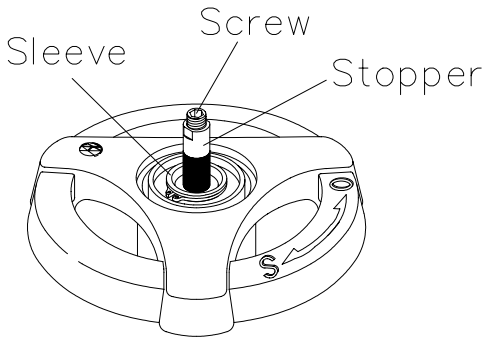
The valve is designed for manual operation only.
（The use of assist device may damage the valve.）

(7) Adjustment procedure for stopper

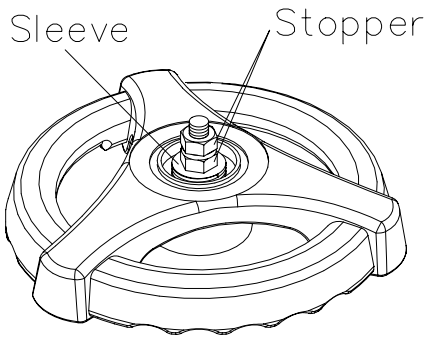
Necessary items

- Spanner wrench
- Allen wrench
- Screw driver(-)
- Protective Gloves
- Goggles

<15-50mm>



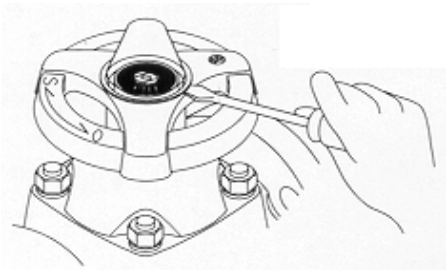
<65-100mm>



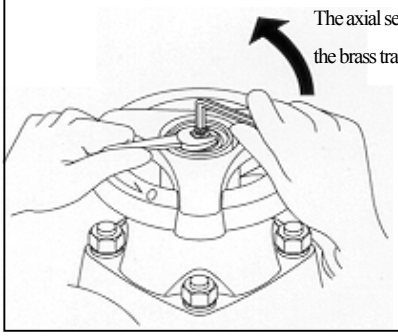
Travel stop adjustment

< Nominal size : 15-50mm >

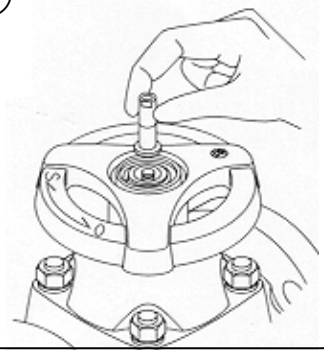
① Turn valve handle clockwise to the full closed position. Remove the gauge cover, being careful not to damage the gauge cover O-ring.



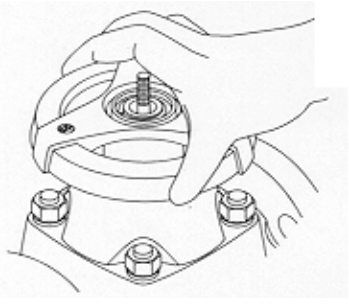
② Remove the travel stop / position indicator with a spanner wrench and loosen the axial set screw counterclockwise with an Allen wrench. The axial set screw is located within the brass travel stop looking down..



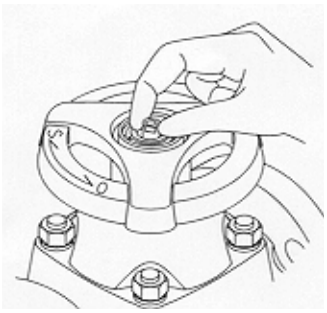
③ Loosen the travel stop counter-clockwise.



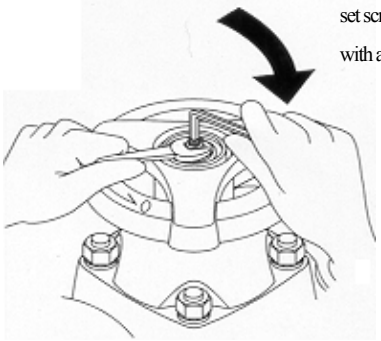
④ Slowly tighten the handwheel clock wise until the leak-by stops.



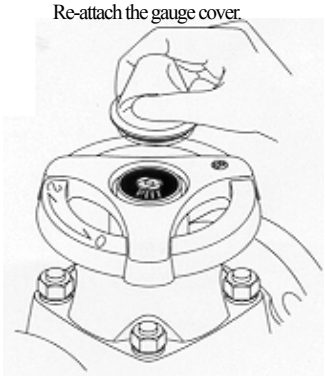
⑤ Tighten the travel stop clockwise until it stop and the turn it back (counter-clockwise)180°.



⑥ Secure the travel stop/position indicator with wrench and tighten the axial set screw clockwise with an Allen wrench.



⑦ Re-attach the gauge cover.



Tightening torque of the screw

Unit : N-m {kgf-cm} [lb-inch]

Nom. Size	15-32mm (1/2"-1 1/4")	40, 50mm (1 1/2", 2")
Torque value	8.0 {81} [71]	12.0 {122} [106]

Travel stop adjustment

< Nominal size 65-100mm >

1) Loosen the gauge cover ⑪ with hand.

2) Loosen the upper nut ⑳ from the lower nut ⑳ with spanner wrench.

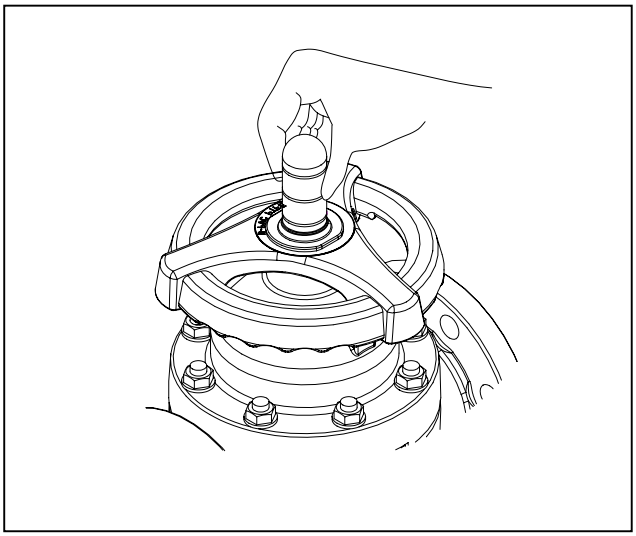
3) Loosen the lower nut ⑳.

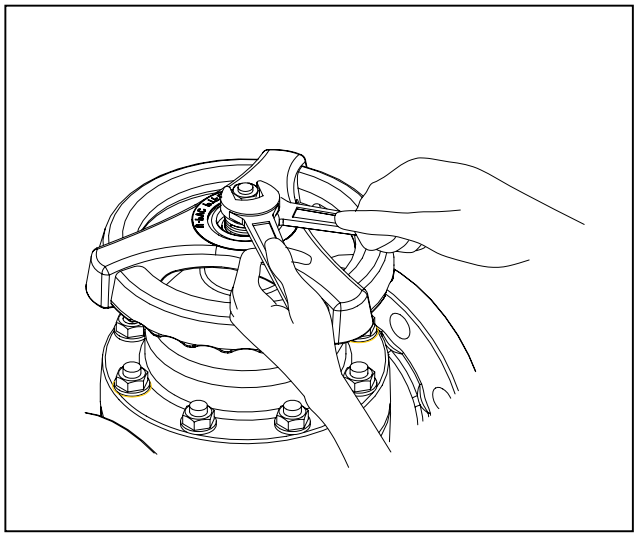
4) Operate the handle wheel to tighten gradually until the leakage of fluid stops.

5) Tighten the lower nut ⑳ until it stop, and then turn it back (counter-clockwise) 180° .

6) Tighten the upper nut ⑳ to the lower nut ⑳ with spanner wrench.

7) Tighten the gauge cover ⑪.





Tightening torque of the screw

Unit : N-m {kgf-cm} [lb-inch]

Nom. Size	65-100mm (2 1/2"-4")
Torque valve	15.0 {153} [133]

(8) Diaphragm replacement procedure

Necessary items

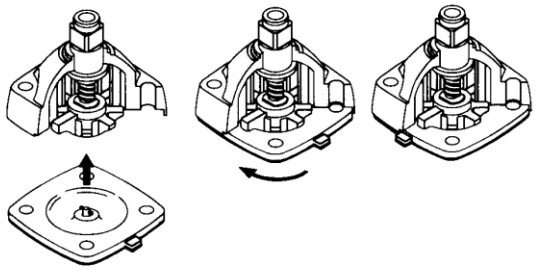
- Torque wrench
- Protective gloves
- Spanner wrench
- Goggles

⚠ Caution

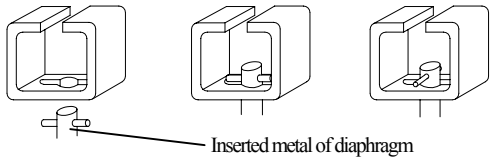
Wear protective gloves and goggles because some fluid is left in the body.
(You can be injured by working without then.)

1) Drain fluid completely from the pipe line.
2) Remove valve bonnet from the body.
3) Turn handle of valve clockwise until it stops.(Do not force it).The compressor should be fully extended out of the bonnet.
4) Bayonet connection type (standard)
   Remove the diaphragm from the compressor by turning it 90° and mount the new diaphragm by reversing step.
   Make sure that the pin of inserted metal of diaphragm connects joint completely.

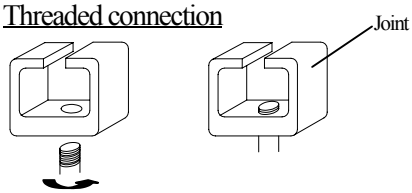
   Threaded connection type
   Turn the diaphragm clockwise to remove the diaphragm and mount the new diaphragm by reversing step.



Bayonet connection



Threaded connection



5) Mount the bonnet to the valve by reversing step 2. Tighten bonnet bolts by hand only.
6) Rotate the handle 360° counter-clockwise.
7) Using a torque wrench, tighten the bonnet bolts in a diagonal, cross-cross pattern.

Bonnet torque value Unit : N-m{kgf-cm}[ib-inch]

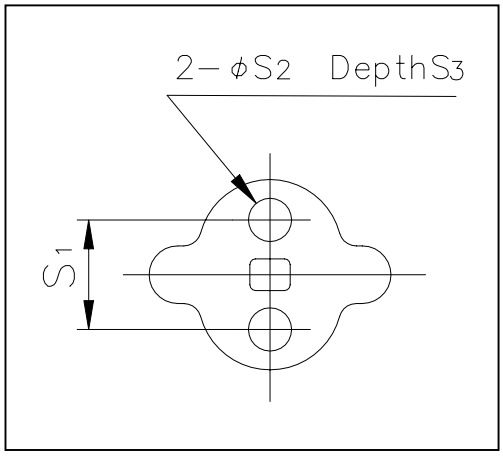
Nom. Size / Diaphragm	15, 20mm (1/2", 3/4")	25, 32mm (1", 1 1/4")	40mm (1 1/2")	50mm (2")	65mmm (2 1/2")	80mm (3")	100mm (4")
Rubber	3.0 {31} [27]	5 .0 {51} [44]	12.0 {122} [106]	15.0 {153} [133]	13.0 {133} [115]	18.0 {184} [160]	35.0 {357} 310
PTFE	5.0 {51} [44]	8.0 {82} [71]	15.0 {153} [133]	20.0 {204} [177]	15.0 {153} [133]	20.0 {204} [177]	40.0 {408} [355]

8) Re-adjust the stopper if necessary.

(9) Mounting an inserted metal, and a base (panel)

Procedure

Refer to the user's manual for the Inserted metal (Ensat)
(Commercially available).

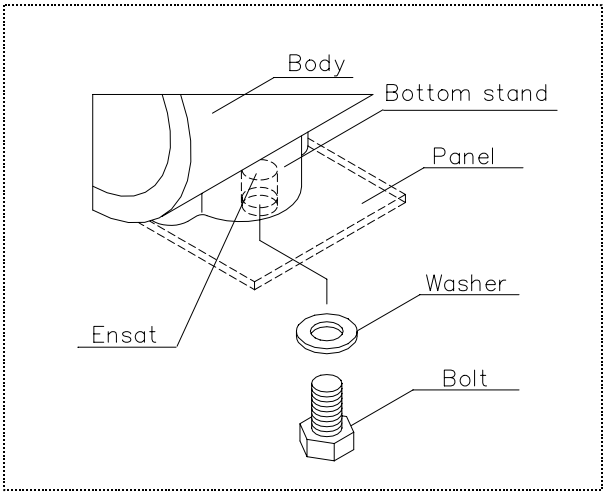


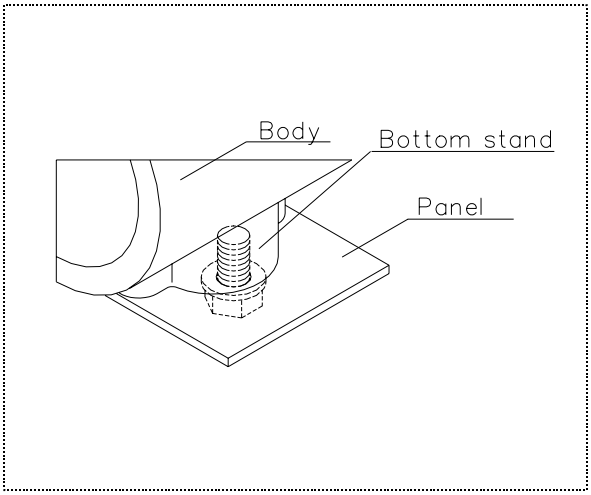
Bottom stand dimension

Unit ; mm (inch)

Nom. Size	S1	S2	S3
15-32mm (1/2"-1 1/4")	25 (0.98)	7 (0.28)	13 (0.51)
40, 50mm (1 1/2", 2")	45 (1.77)	9 (0.35)	15 (0.59)
65mm (2 1/2")	85 (3.35)	11 (0.43)	20 (0.79)
80mm (3")	100 (3.94)	15 (0.59)	28 (1.10)
100mm (4")	120 (4.72)	15 (0.59)	28 (1.10)

Fixation of bottom stand with panel





(10) Inspection items

○Inspect the following items.

(1)	Check for any flaw, crack, or deformation on the outside.
(2)	Check whether fluid leaks to the outside.
(3)	Check whether the cap nut has been loosened.
(4)	Check whether the handle can be operated smoothly.

(11) Troubleshooting

Problem	Cause	Treatment
Fluid is leaking past the fully closed position.	The travel stop is not set correctly.	Adjust the travel stop.
	Solid particles have lodged in the valve.	Clear the solid particles from the valve.
	Media has worn diaphragm and / or weir.	Replace.
Valve can not be fully open.	The diaphragm has pulled off the stem.	Replace diaphragm. If the valve is in vacuum service, special vacuum valves may be required. Consult factory.
	The metal joint failed.	Remove Diaphragm & compressor and replace joint.
The handle spins freely.	The stem is broken.	Disassemble bonnet and replace the stem.
	The metal joint failed.	Remove diaphragm & compressor and replace joint.
Valve leaks between body and bonnet.	Bonnet bolts have loosened.	Re-tighten.
	Media has crystallized on the diaphragm.	Disassemble and clean on a regular basis. Replace failed diaphragm, if necessary.
	The diaphragm has failed due to fatigue.	Replace.
Valve leaks from stem.	The diaphragm has failed.	Replace.

(12) Handling of residual and waste materials

⚠ Caution

In discarding remaining or waste materials, be sure to ask a waste service company.
（Poisonous gas is generated.）

(13) Marking

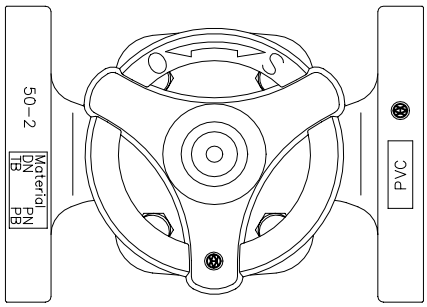
EN marking

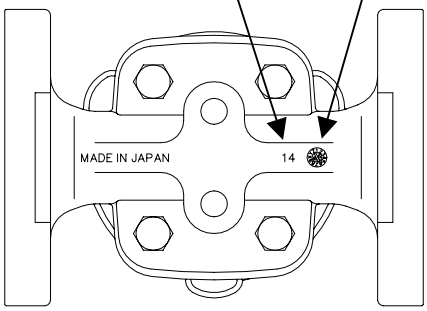
DN : Nominal size
PN : Nominal press.
TB : Max. allowable working temp.
PB : Max. allowable working press.

※ Molded date

Valve type

Date marking

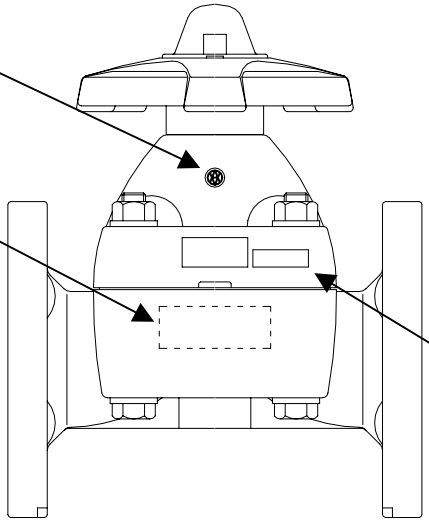




Bottom view

AOC symbol

EN marking
·In case of true union type



CE0035 label

Valve label

02 B 00001 F
① ② ③ ④

① Year (ex. 02→2002)
② Month (ex. A→Jan. B→Feb. ····· L→Dec.)
③ Ser. No.
④ Revision symbol

Material	Nominal size	Nominal press.	Max. allowable working temp.	Max. allowable working press.
PVC	DN15, DN20, DN25,DN32, DN40, DN50	PN10	60℃	7 BAR
	DN65, DN80, DN100	PN10	60℃	8 BAR
C-PVC	DN15, DN20, DN25,DN32, DN40, DN50	PN10	90℃	3 BAR
	DN65, DN80, DN100	PN10	90℃	6 BAR
PP	DN15, DN20, DN25,DN32, DN40, DN50	PN10	90℃	5 BAR
	DN65, DN80, DN100	PN10	90℃	6 BAR
PVDF	DN15, DN20, DN25,DN32, DN40, DN50	PN10	120℃	5 BAR
	DN65, DN80, DN100	PN10	120℃	5 BAR

Note. Label of "CE0035" are applied to valves DN32 and over.

If the nameplate is damaged or become dirty, let our Sales Division know the "Manufacturing number". We will send a new nameplate.

(14) Inquiries

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Distributor

Diaphragm Valve Type 14
True Union Diaphragm Valve Type 14

ASAHI AVVALVES

Information in this manual is subject to change without notice.

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